Anchor Environmental, L.L.C.
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Memorandum

To: Sean Sheldrake, EPA

From: Ryan Barth and Carl Stivers, Anchor Environmental, L.L.C.

CC: Rick Wadsworth, Parametrix Inc.
Patty Dost, Schwabe Williamson & Wyatt
Bob Wyatt, NW Natural

Date: September 20, 2006

Re: Gasco Long-Term Visual Monitoring Results and Proposed Monitoring Frequency

In accordance with the Monitoring and Reporting Plan (MARP; Anchor 2006), long-term visual monitoring of the removal action area at the NW Natural "Gasco" site (Site) was conducted to monitor the potential release of sheen/product following construction of the EPA-approved pilot cap. As described in the MARP (Anchor 2006), visual monitoring was conducted on a monthly basis from April 2006 through July 2006. As the river discharge decreased in August 2006, the monitoring frequency was increased again to once per week to monitor for potential increased erosion due to wave action on the shoreline during low river elevations. The MARP did not specify the visual monitoring frequency following the weekly August sampling, but rather indicated that monitoring would be scaled back to monthly through November 2006 in consultation with EPA. The purpose of this letter is to submit the visual monitoring results collected to date and propose a visual monitoring frequency through November (when the third and final Year 0 monitoring event is scheduled) and beyond pending future implementation of a final Site-wide remedy.

Visual Monitoring Results

Visual monitoring was conducted during the following periods:

- December 31, 2005
- March 20 to 23, 2006 (during Year 0 Event 1A sampling attempt)
- April 24 to May 2, 2006 (during Year 0 Event 1B sampling)
- June 6, 2006
- July 27, 2006 and July 31, 2006

- August 8, 14, and 21
- August 28 to September 1, 2006 (during Year 0 Event 2 sampling)

The December 31, 2005 monitoring was requested by EPA due to the presence of heavy rains in the Portland area. The results of this monitoring were previously submitted to EPA and are provided in Appendix A. In summary, no sheen/product release was identified in the removal action area and, due to the high water levels, observations of erosion/deposition of the pilot cap and fringe cover were not physically possible.

The visual monitoring results from March through September were very similar, as shown in Appendix B. In summary, the following was observed:

- No sheen/product was observed to originate from within the pilot cap area throughout the visual monitoring period.
- During each monitoring period, the oil containment boom used by the tenant that operates the oil pipeline directly adjacent to the removal action area was stored by laying the boom parallel to the shoreline in the upstream direction. This boom served to restrict access to the removal action area.
- No recreational watercraft users were identified in the vicinity of the removal action area throughout the visual monitoring period.
- No erosion was identified along the exposed, visible shoreline area.
- Some of the fringe cover material placed in the nearshore area over top of the organoclay mat dispersed a short distance upstream/downstream from the mat. This movement led to exposure of the leading edge of the organoclay mat beginning in March (beneath the water surface) through September (in the dry). The amount of exposed organoclay mat did not vary during this period. As specified in the design, the shoreward leading edge of the organoclay mat was covered with fringe cover and anchored into place through the placement of regularly spaced wood stakes through the mat and into the underlying fringe cover placed on the flat area (i.e., bench) just above the dredge slope. No armor layer was placed on the top of the bench during the mat installation, as the mat in the bench area was only used to ensure the dredge slope was fully covered by the mat and did not function to contain potential seepage from the cut slope. Although the exposed edge of the mat

is not affecting the containment effectiveness, NW Natural has initiated placement (by hand) of riprap from the shoreline area over the exposed mat areas.

- As summer progressed and the river elevations decreased to their lowest levels of the year in late August 2006, the sediments that were left undisturbed directly downstream from the removal action area became exposed. A small area of these sediments contained visible tar. No sheen was observable in the water column adjacent to this area.

Proposed Future Visual Monitoring Frequency

The monitoring observations were identical throughout each of the individual monitoring events with changes in regional precipitation, tides, river elevations, wind conditions, and ongoing vessel activities associated with the adjacent oil pipeline operations. Due to this lack of variability, NW Natural proposes that visual monitoring continue to be conducted once monthly during September, October and November 2006 as described in the MARP. If the visual monitoring observations are similar for October and November, NW Natural proposes to reduce future visual monitoring to be concurrent with the scheduled annual monitoring events in November and August and during high magnitude storm events that have the potential to scour the pilot cap, if any. Following the November Year 0 Event 3 sampling, NW Natural will coordinate further with EPA to finalize the future visual monitoring frequency.

APPENDIX A

POST-CONSTRUCTION VISUAL MONITORING REPORT MEMORANDUM - January 18, 2006

Anchor Environmental, L.L.C.
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Portland, OR 97224
Phone 503.670.1108
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Memorandum

To: Sean Sheldrake, U.S. Environmental Protection Agency

From: Ryan Barth and Carl Stivers, Anchor Environmental, L.L.C.

CC: Robert Wyatt, NW Natural

Patty Dost, Schwabe Williamson & Wyatt

Rick Wadsworth, Parametrix

Date: January 18, 2006

Re: January 3, 2006 Post-Construction Visual Monitoring Report, NW Natural Gasco Site, Portland, Oregon

On December 31, 2005 (email correspondence) the United States Environmental Protection Agency (EPA) requested that NW Natural conduct visual monitoring of the tar body removal area at the Gasco site (Site) due to the presence of heavy rains in the Portland area. Visual monitoring is a proposed element for long-term monitoring at the Site, but the Monitoring and Reporting Plan (MARP) is currently in draft form, so no visual monitoring has been conducted to date. Therefore, the requested visual monitoring was to be an interim monitoring activity during finalization of the MARP.

In accordance with EPA's request, Anchor field staff mobilized to the Site on January 3, 2005 from 16:10 to 16:50 to perform visual observations of the tar body removal area. The visual monitoring was conducted in accordance with the procedures discussed in the EPA-reviewed draft MARP. Observations were recorded on a Visual Observations Log Form designed specifically for this project (Attachment A). At the time of the Site visit, the temperature was between 40 – 45° F with a light steady rain and moderate wind from the east. Small, wind-generated ripples were observed in the tar body removal area. Visual observations were performed from the top of the bank and along the oil pipeline structure. Photographs (Attachment B) were taken and observations were made from a variety of vantage points to ensure visual coverage of the tar body removal area.

Monitoring occurred right before a daily low tide (17:07) and before, during, and after sunset (16:40). Although monitoring was conducted during a low tide, the shoreline cap extents, beach area, and riprap were completely underwater due to the high stage of the river. The water level was above the line of vegetation along the banks of the river. According to USGS real-time water data for gage 14211720 (Willamette River at Portland, OR; Attachment C), the gage height of the river at this time was approximately 13 feet NAVD 88. The river water was turbid and light brown in color. In addition, several very large logs (i.e., approximately 2 feet in diameter) and other wood debris were observed floating in the project area or otherwise snagged on pilings.

Given the high water level, observations of erosion/deposition of the cap and fringe cover were not physically possible. Otherwise, there were no areas where sheen/product releases were observed in the project vicinity. The oil containment boom that was left in place following construction has become detached from the shoreline and floated out into the river (see Attachment B). Given there was no sheen observed, NW Natural did not see an immediate need for replacement of the boom. Leaving this segment of boom in place was not a part of the EPA-approved design and was a voluntary measure by NW Natural to assist in limiting of potential sheens should they occur. As visual observations continue in coming weeks, NW Natural will assess the need for replacing/reconnecting the boom if sheens are observed. A specific proposal for the type, configuration, and maintenance of such a boom will be submitted to EPA should this condition occur. It should be noted that the tenant currently leasing the NW Natural oil pipeline facilities has a permanent boom installed at the Site (see Attachment B). This boom would act as a second containment barrier for sheens associated with the removal action area should they occur in the short term or over the longer term.

List of Attachments

Attachment A—Visual Observations Log Form
Attachment B—Photographs
Attachment C—USGS Real-Time Water Data for the Willamette River at Portland, Oregon

ATTACHMENT A

ANCHOR ENVIRONMENTAL, L.L.C. Visual Observations Log Form

Date: 1-3-06

Location: Gasco

Project Name: Gasco Project Number: 000029-02

Monitoring Period:

Time Observations Started: 1610 Time Observation Concluded: 1650

Weather Conditions: 40-45° F, light steady rain, moderate wind from E

Wave Action Observations: small, wind-generated ripples

Photographs Taken: (Yes) No

Tidal Conditions: High (Low) Ebb (Slack) Flood

Observations of Erosion/Deposition: Cap and rip-rap shoreline/beach completely underwater. water level above line of vegetation on banks of river.

Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.) Oil boom has become detached at one end. Organo-clay mat presumably in place underwater.

Other Comments: No sheen seen anywhere at the site. Water is turbid, light brown. Large volume of water entering river from GASCO outfall. Visual monitoring conducted from top of bank and along pipeline structure. Large logs and other floating wood debris present along shorelines and snagged on pilings.

Recorded by: KRT / BrnH

ATTACHMENT B

View from the pipeline walkway looking upstream toward outer removal area. Note boom placed to restrict vessel track within the tar body removal area.

View from the pipeline walkway looking upstream along shoreline.

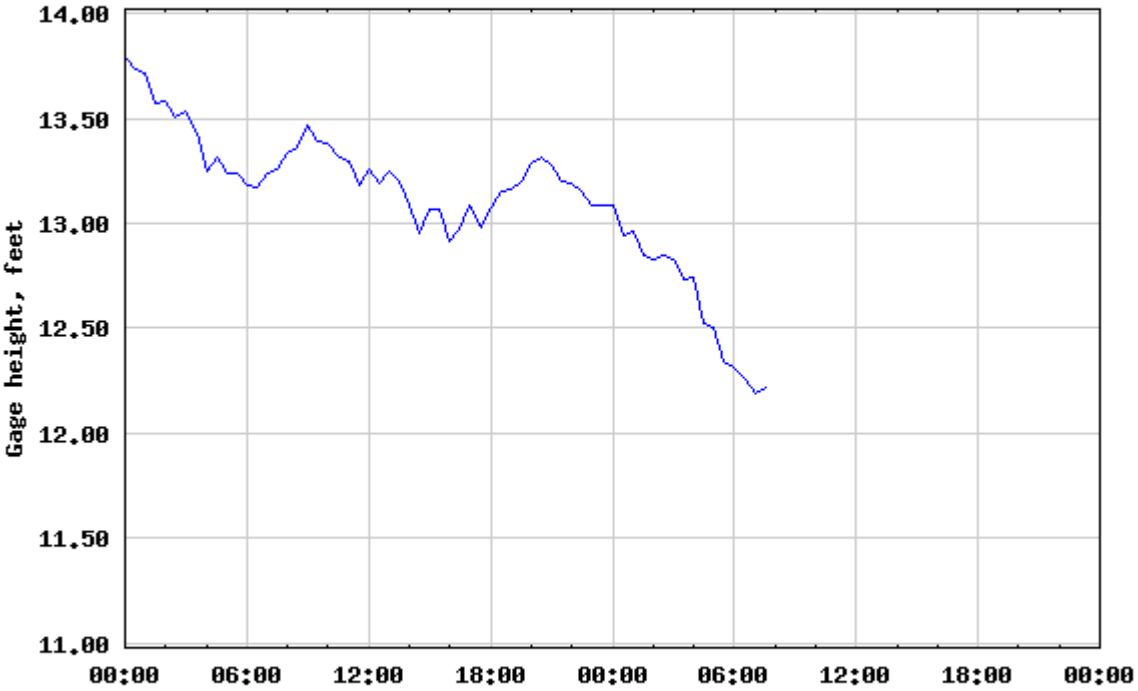
View from upstream observation deck looking downstream along shoreline.

View from top of bank looking channel ward toward tar body removal area. Note oil containment boom present near the channel ward pipeline support has become detached from the shoreline.

ATTACHMENT C

USGS

USGS 14211720 WILLAMETTE RIVER AT PORTLAND, OR



Provisional Data Subject to Revision

APPENDIX B

VISUAL OBSERVATION LOGS AND PHOTOGRAPHS

Visual Observations Log Form

Date	March 20-23, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Year O Event 1A Pilot Cap Monitoring		
Time Observations Started:	March 20, 2006	**Time Observation Concluded:**	March 23, 2006
Weather Conditions:	Variable from overcast to windy with light rain, upper 40's to high 50's		
Wave Action Observations:	Small wind generated waves to pleasure craft/tug vessel generated waves		
Photographs Taken:	(Yes) No		
Tidal Conditions:	Ranged from high/low to ebb/flood.		
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of fringe cover accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. No sheens/odors were observed in the vicinity of the mat. Throughout the day Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline unless oil transfer was occurring.		

Other Comments:
This monitoring was conducted during the field activities conducted as part of the MARP Year 0 Event 1A monitoring. The monitoring was conducted continuously from March 20-23, 2006. No sheens or erosion were observed. Slight migration of the fringe cover material placed above the organoclay mat in the upstream/downstream direction was observed. The tide staff gage installed during the construction was missing. It was likely damaged during a high winter flow event. The river water level was above the shore ward edge of the dredge prism.

Recorded by: **Ryan Barth**

Photo 1 – *General overview of shoreward edge of dredge prism*

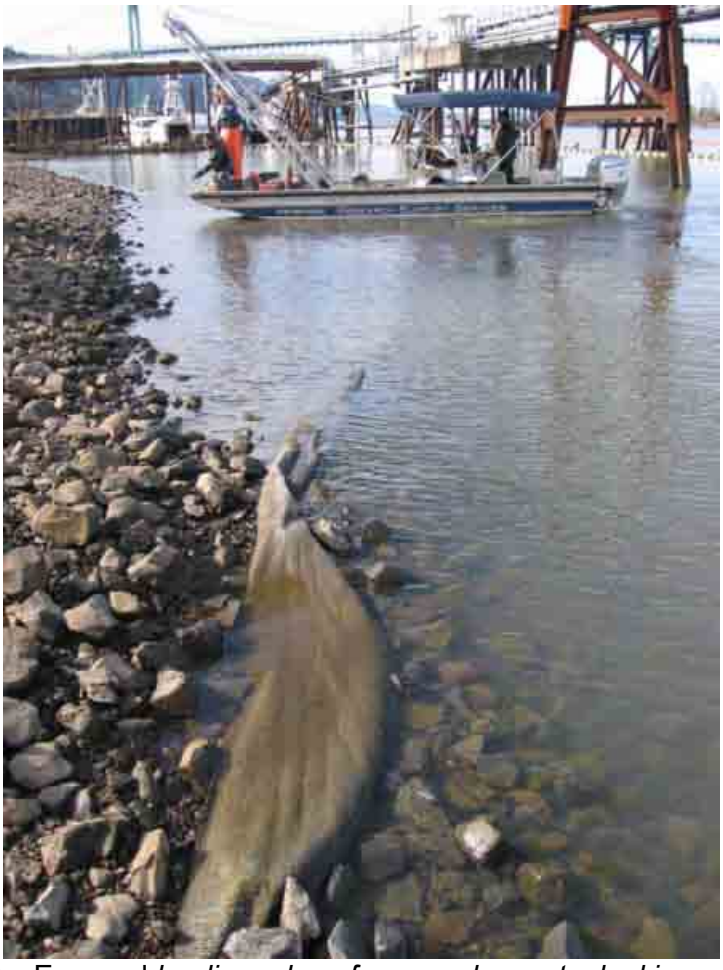


Photo 2 – Exposed *leading edge of organoclay mat – looking upstream*

Photo 3 – *Fringe cover placed above oranoclay mat – looking downstream*

Visual Observations Log Form

Date	April 24 to May 2, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Year O Event 1B Part 1		
Time Observations Started:	April 24, 2006	**Time Observation Concluded:**	May 2, 2006
Weather Conditions:	Variable from overcast to sunny with light wind, mid-70s to 80s.		
Wave Action Observations:	Small wind generated waves to pleasure craft/tug vessel generated waves		
Photographs Taken:	(Yes) No		
Tidal Conditions:	Ranged from high/low to ebb/flood.		
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of sand accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. During monitoring, the quarry spalls were present as placed during construction maintaining the mat along the slope so it could function as designed. No sheens/odors were observed in the vicinity of the mat. Throughout the day Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline.		

Other Comments:
This monitoring was conducted during the field activities conducted as part of the MARP Year 0 Event 1B monitoring (i.e., coring, porewater, and near-bottom surface water collection was conducted). This monitoring event is termed Part 1 given an additional field day (i.e., Part 2) involved the retrieval of the semipermeable membrane devices (SPMDs) installed during the Part 1 activities and visual observations of the removal area were also conducted during those activities. The Part 1 monitoring was conducted continuously from April 24 to May 2, 2006. No sheens or areas of erosion were observed. The tide staff gage installed during the construction was missing. The river water level was above the shoreward edge of the dredge prism.

Recorded by: **Ryan Barth**

Photo 1 – General photo of the shoreline above the pilot cap area.

Photo 2 – FAMM tenant oil absorbent boom containing the pilot cap area

Visual Observations Log Form

Date	June 6, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Year O Event 1B Part 2		
Time Observations Started:	June 6, 2006	**Time Observation Concluded:**	June 6, 2006
Weather Conditions:	Variable from overcast to sunny with light wind, mid-80s.		
Wave Action Observations:	Small wind generated waves to pleasure craft/tug vessel generated waves		
Photographs Taken:	(Yes) No		
Tidal Conditions:	Ranged from high/low to ebb/flood.		
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of sand accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. During monitoring, the quarry spalls were present as placed during construction maintaining the mat along the slope so it could function as designed. No sheens/odors were observed in the vicinity of the mat. Throughout the day Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline unless oil transfer was occurring.		

Other Comments:
This monitoring was conducted during the field activities conducted as part of the MARP Year 0 Event 1B monitoring. This monitoring event is called Part 2 given visual monitoring was also conducted (i.e., Part 1) during deployment of the semipermeable membrane devices (SPMDs) from April 24 to May 2, 2006. No sheens, areas of erosion or exposed tar body were observed in the removal action area. The tide gage was replaced to facilitate real-time determination of river elevations at the Site. The river water level was above the shoreward edge of the dredge prism.

Recorded by: **Ryan Barth**

Visual Observations Log Form

Date	July 27, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Pilot Cap Monitoring		
Time Observations Started:	July 27, 2006 @0930	**Time Observation Concluded:**	July 27, 2006@1100
Weather Conditions:	Partly cloudy, light NW wind(0-5 mph), 68-75 F		
Wave Action Observations:	Small wind generated waves to pleasure craft/tug vessel generated waves		
Photographs Taken:	(Yes) No		
Tidal Conditions:	2-3 hrs after high tide	WLE falling from approx: 10.2 feet	To: 9.8 feet NAVD 88
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of sand accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. During monitoring, the quarry spalls were present as placed during construction maintaining the mat along the slope so it could function as designed. No sheens/odors were observed in the vicinity of the mat. Throughout the day Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline unless oil transfer was occurring.		

Other Comments:
No sheens or exposed tar body were observed. The tide staff gage installed during the construction was in place but unreadable due to fouling. The river water level was at approximately the shore ward edge of the dredge prism.

Recorded by: **Tim Stone**

Photo 1—*general overview of tar body removal and cap placement area*

Photo 2—*shoreward strip of organo-clay mat no longer covered by fringe cover*

Photo 3—*exposed portion of organo-clay mat after being temporarily secured with site rip-rap*

Photo 4—*current condition of voluntary downstream oil containment boom*

Visual Observations Log Form

Date	July 31, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Pilot Cap Monitoring—Week #1 August 2006		
Time Observations Started:	July 31, 2006 @0800	**Time Observation Concluded:**	July 31, 2006@1000
Weather Conditions:	Clear, moderate W wind(10-15 mph), 65-70 F		
Wave Action Observations:	Small wind generated waves to pleasure craft/tug vessel generated waves		
Photographs Taken:	Yes (No)		
Tidal Conditions:	1-3 hrs after low tide	WLE rising from approx: 8.1 feet	To: 9.1 feet NAVD 88
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of sand accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. During monitoring, the quarry spalls were present as placed during construction maintaining the mat along the slope so it could function as designed. A 3-5 foot long section of the mat was also visible on the shoreward upstream edge of the matted area. No sheens/odors were observed in the vicinity of the mat. Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline during the site visit.		

Other Comments:
No sheens or exposed tar body were observed. The tide staff gage installed during the construction was in place but unreadable due to fouling. The river water level was slightly below the shoreward edge of the dredge prism.

Recorded by: **Tim Stone**

Visual Observations Log Form

Date	August 8, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Pilot Cap Monitoring—Week #2 August 2006		
Time Observations Started:	August 8, 2006 @0730	**Time Observation Concluded:**	August 8, 2006@0930
Weather Conditions:	clear, light West wind(0-5 mph), 64-68 F		
Wave Action Observations:	Small wind generated waves to tug vessel generated waves		
Photographs Taken:	(Yes) No		
Tidal Conditions:	3-5 hrs after high tide	WLE falling from approx: 9.8 feet	To: 9.1 feet NAVD 88
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of sand accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. During monitoring, the quarry spalls were present as placed during construction maintaining the mat along the slope so it could function as designed. No sheens/odors were observed in the vicinity of the mat. Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline during the visit.		

Other Comments:
No sheens or exposed tar body were observed. The tide staff gage installed during the construction was in place but unreadable due to fouling. The river water level was approximately at the shoreward edge of the dredge prism.

Recorded by: **Tim Stone**

Photo 1—*shoreward edge of dredge prism*

Photo 2—*general overview of shoreward edge of dredge prism*

Photo 3—*exposed portion of organo-clay mat at upstream-shoreward corner*

Visual Observations Log Form

Date	August 14, 2006		
Location:	NW Natural “Gasco” Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Pilot Cap Monitoring—Week #3 August 2006		
Time Observations Started:	August 14, 2006 @0830	**Time Observation Concluded:**	August 14, 2006@1030
Weather Conditions:	clear, moderate northwest wind(5-10 mph), 68-72 F		
Wave Action Observations:	Small wind generated waves (3-6 inches) to tug vessel generated waves (1-2 feet)		
Photographs Taken:	(Yes) No		
Tidal Conditions:	2 hrs. after low tide	WLE rising from approx: 8.24 feet	To: 9.86 feet NAVD 88
Observations of Erosion/Deposition:	Fringe cover sand evident along the shoreline in the removal action area. Also a small area of sand accumulation just upstream and downstream from the pilot cap footprint.		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	The shoreward leading edge of the organo-clay mat was visible above the slope created by the removal action. During construction, fringe cover material was placed on top of this portion of the mat to keep it in place temporarily and quarry spalls were placed just below the leading edge to armor the mat and prevent erosion of the slope created by the removal action. During monitoring, the quarry spalls were present as placed during construction maintaining the mat along the slope so it could function as designed. No sheens/odors were observed in the vicinity of the mat. Fuel and Marine Marketing (FAMM) stored their oil containment boom across the majority of the Gasco shoreline upstream of the oil-pipeline—a portion of which was grounded during the visit(see photo 3).		

Other Comments:
No sheens or exposed tar body were observed. The tide staff gage installed during the construction was in place but unreadable due to fouling. The approximate river water level ranged from just below to right at the shoreward edge of the dredge prism.

Recorded by: **Tim Stone**

Photo 1—*shoreward edge of dredge prism*

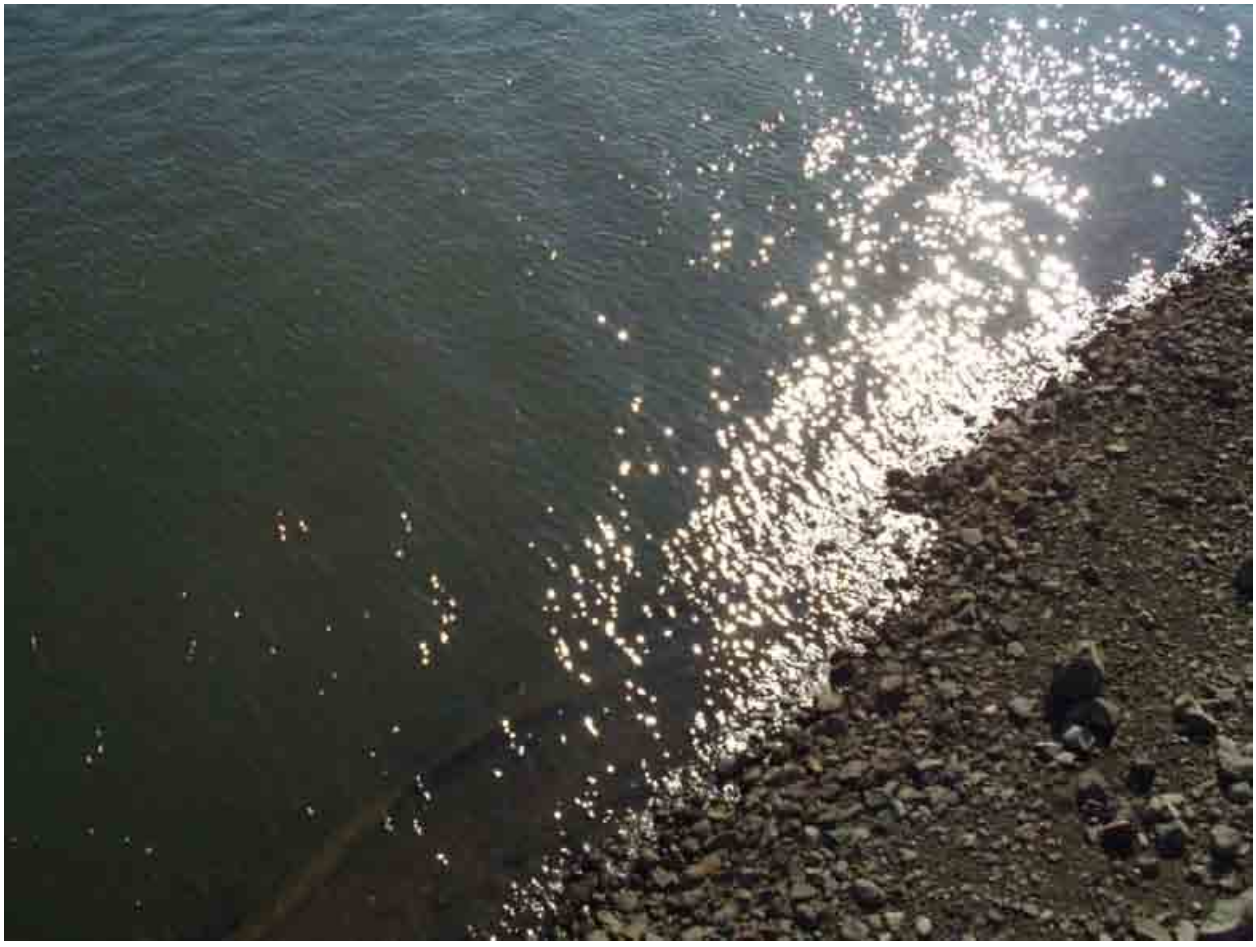


Photo 2—*general overview of shoreward edge of dredge prism*

Photo 3—*dredge prism area with FAMM oil boom stretched across site (portion grounded upstream)*

Visual Observations Log Form

Date	August 21, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Pilot Cap Monitoring—Week #4 August 2006		
Time Observations Started:	August 21, 2006 @1530	**Time Observation Concluded:**	August 21, 2006@1645
Weather Conditions:	Mostly sunny, 80-85 °F, light wind from ESE		
Wave Action Observations:	Waves ranging from small, wind-generated waves (3-6 inches in height) to larger waves generated by tug vessels (1-2 feet in height)		
Photographs Taken:	(Yes) No		
Tidal Conditions:	1 hour after low tide	WLE rising from approx: 7.05 feet	To: 8.24 feet NAVD 88
Observations of Erosion/Deposition:	Sand deposits were evident along the shoreline, including upstream and downstream of the dredge prism (photo 1).		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	Portions of the organo-clay mat were exposed (photos 2 and 3). No sheens/odors were observed in the vicinity of the mat. A yellow oil boom was wrapped around a pipeline support (photo 1) which has been in this location since completion of construction. An oil boom was in place across the face of the Site from Fuel and Marine Marketing (FAMM) to a wooden dolphin at the upstream edge of the Site (photos 1, 4, and 5).		

Other Comments:
No sheens, areas of erosion or exposed tar body were observed in capped area.

Recorded by: **Kelly Titkemeier**

Photo 1 – *General overview of shoreward edge of dredge prism*

Photo 2 – *Upstream edge of organo-clay mat exposed*

Photo 3 – *Exposed organo-clay mat near pipeline*

Photo 4 – *Upstream attachment of oil boom*

Photo 5 – *Oil boom in-place across face of Site*

Visual Observations Log Form

Date	August 28 to September 1, 2006		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	During Year 0 Event 2 Long-Term Monitoring		
Time Observations Started:	Daily at approx. 0800	**Time Observation Concluded:**	Daily at approx. 1700
Weather Conditions:	Variable from cloudy, 65 °F, light wind from the NE to sunny with no breeze		
Wave Action Observations:	Waves ranging from small, wind-generated waves (3-6 inches in height) to larger waves generated by boats (1-2 feet in height)		
Photographs Taken:	(Yes) No		
Tidal Conditions:	Full range of tidal conditions		
Observations of Erosion/Deposition:	Sand deposits were evident along the shoreline, including upstream and downstream of the dredge prism (photo 1). Some of the riprap used to armor the organoclay mat has been displaced around the edges, where the mat is now exposed (see observations below).		
Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)	Portions of the organo-clay mat were exposed at the upstream edge of the dredge prism (photo 2) and the downstream portion of the dredge prism (photo 3). No sheens/odors were observed in the vicinity of the mat, including the exposed areas. A yellow oil boom was wrapped around a pipeline support. The oil boom typically in place across the face of the Site from Fuel and Marine Marketing (FAMM) to a wooden dolphin at the upstream edge of the Site was not in place due to post-construction monitoring activities occurring in-water over the dredge prism/pilot cap area.		

Other Comments:
No sheens, areas of erosion or exposed tar body were observed in the pilot cap area. The visual monitoring was conducted continuously during the Year 0 Event 2 long-term monitoring activities.

Recorded by: **Ryan Barth**

Photo 1 – *General overview of shoreward edge of dredge prism*

Photo 2 – *Upstream edge of organo-clay mat exposed*

Photo 3 – *Exposed organo-clay mat near pipeline*